

# The Stink Over Diesels

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# The Decade of the Diesel

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- Health Studies show problems with diesel exhaust
  - Causes allergy symptoms, including inflammation and irritation of airways
  - Exacerbates bronchitis and pneumonia; decreases lung function
  - Identified as a probable human carcinogen
  - Causes “premature mortality” - death



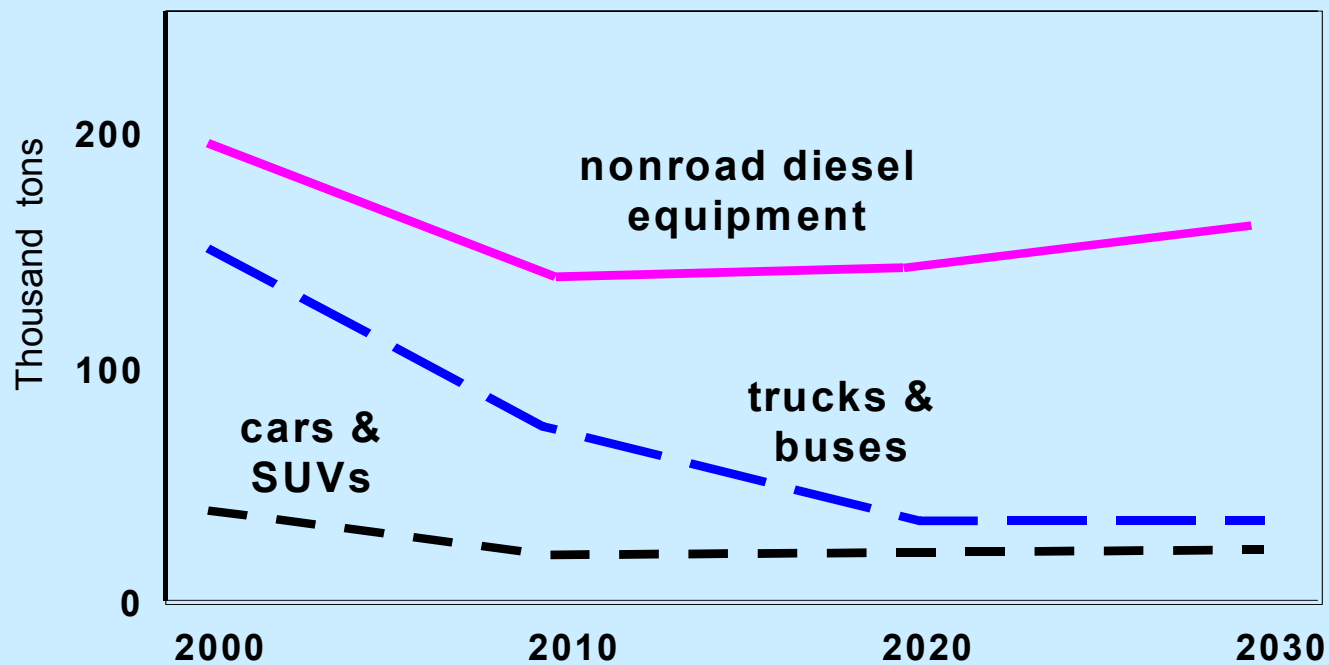
# The Decade of the Diesel

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- What's in Diesel Exhaust that's so bad?
  - Particulate Matter – Toxic Mix
    - Smoke – what you see from the tailpipe
    - TSP – contributes to hazy skies
    - PM 10 - invisible
    - PM 2.5 – “inhalables” - direct to the lungs
  - Carbon Monoxide
  - Ozone Precursors – VOCs and NOx
  - Other Air Toxics

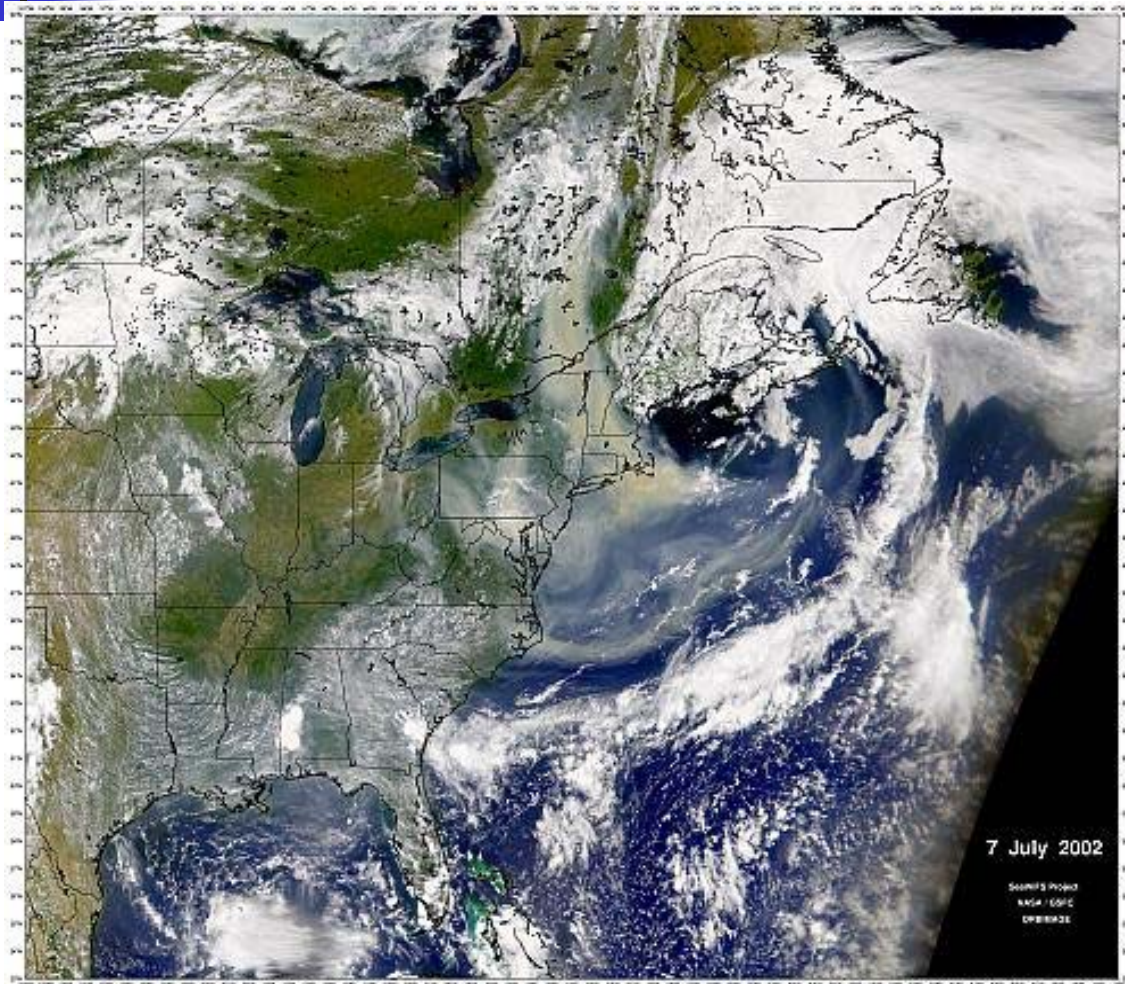
# Where Does PM Come From?

## Mobile Source PM

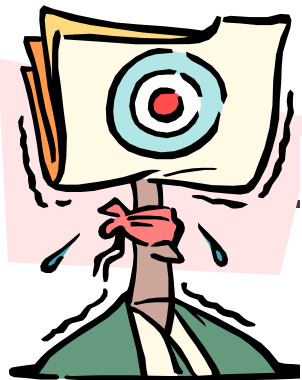


# Smoke, TSP, PM 10 and PM 2.5

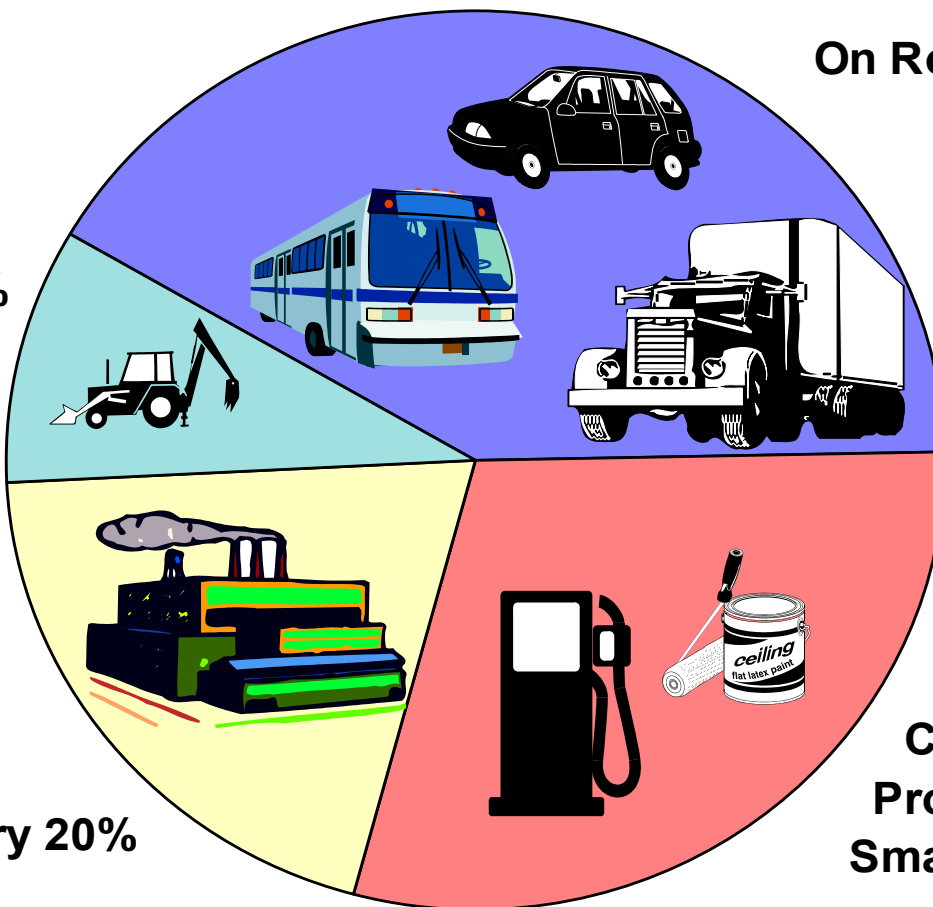
It's not  
just  
buses  
and  
trucks



*"Don't Tax You, Don't Tax Me  
Tax That Fella Out Behind That Tree"*



Off Road 9%



On Road 41%

**Sources of Ozone  
Precursors in  
Massachusetts**

**VOCs and NOx**

Industry 20%

Consumer  
Products and  
Small Business  
29%

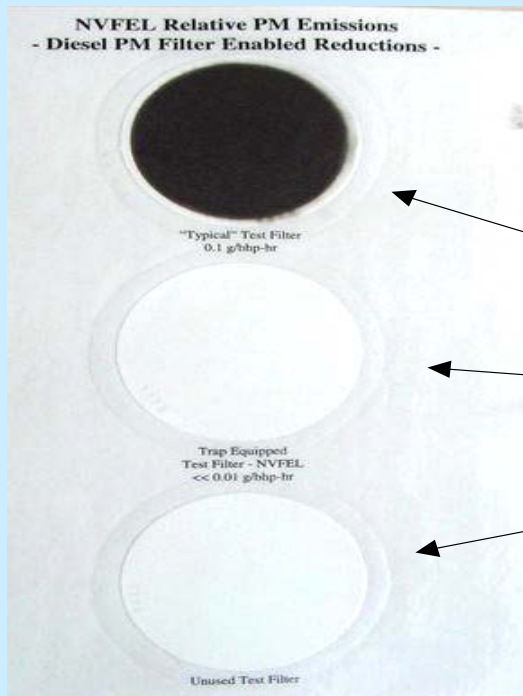


# The Decade of the Diesel

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- Public Policy reflects Health Studies
  - New engine standards
  - New fuel standards (diesel and gasoline)
  - Pressure to retrofit
  - “Anti-Idling”
  - Enforcement actions
  - Cleaner alternative fuels

# Cleaner Exhaust: Effect of Particulate Traps



## PM Emissions with Trap

- Typical test filter – current standards
- Test filter – 2007 standards
- Unused test filter





# What's Coming – New Engine Standards

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- Phase One in 2004:
  - PM: 0.10 grams per brake-horsepower-hour (g/bhp-hr)
  - Combined NO<sub>x</sub> and NMHC: 2.5 g/bhp-hr
- Phase Two starting in 2007 (fully implemented by 2010):
  - PM: 0.01 grams per brake-horsepower-hour
  - Combined NO<sub>x</sub> and NMHC: 0.20 g/bhp-hr



# What's Coming – Cleaner Fuel

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- Current highway diesel has approximately 500 ppm sulfur content
- Ultra low sulfur diesel (ULSD), 30 ppm sulfur, available now in limited quantities
- 2006 ULSD, 15 ppm, supplied nationwide



# What's Coming - Retrofits

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- Particulate Filters
- Oxidation Catalysts



# School Buses - Retrofits

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- Retrofits available
- Who pays?
  - Schools?
  - Companies?
- Other methods
  - SEPs
  - State revolving fund – California
  - Grants – Puget Sound



# School Buses - Idling

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- MA Anti-Idling law
- Reduced Idling policies by bus companies and associations
- Re-certification Training - reduce idling
- Anti-Idling policies by schools
- To include private motor vehicles, too ???
- Publicizing benefits of reduced MOTOR VEHICLE idling at schools
- Drivers: Shut It Down – You Hold the Key



# School Buses

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- High safety record
- MA receives B+ in Pollution Report from Union of Concerned Scientists
- Look for increasing pressure to become greener



# School Buses – Both Yellow & Green

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- Enviably safe record for precious cargo
- How green will you be?
- Bad equation:  
Fewer pupils riding buses +  
More private vehicle trips =  
More pollution